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Forecast of changes in soil rroperties of foundation of the residential complex in Kazan city (Russia) on the basis of a numerical simulation of geofiltration

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Abstract

© 2018, International Multidisciplinary Scientific Geoconference. All rights reserved. One of the most complicated and difficult problems in design of foundations is the nesseserity to quantify changes in the strength and deformation properties of soils foundations according to projected increase in soil moisture. This article presents the results of solving such kinds of problems on the example of a residential complex of twenty buildings, located in the Eastern part of Kazan City. The forecast of changes of hydrogeological conditions over a period of 50 years had been made by using numerical modelling of geofiltration in the study area. Filtration model was built in the program Processing Modflow 5.3.3. The change in groundwater levels was caused by infiltration from precipitation, as well as by projected leaks from water-carrying communications. Quantitative change of soil properties was performed on the basis of calculating the target degree of saturation of the soil. The simulation results of geofiltration allowed us to calculate that the maim groundwater level may rise from depths of 30 m to a depth of 24 m. Additionally, within 8 m from the ground surface can occur groundwater "perched". Therefore, for soils in these ranges will increase their water content and decrease their strength and deformation properties. On the basis of carried out research on the forecast map of level's changes of groundwater and the forecast table of physical and mechanical properties of soil's bases were made. The obtained results were used to design the foundations of the residential complex.

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Keywords

Forecast, Geofiltration, Numerical simulation

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